

WHAT IS CLAIMED IS:

1 ~~Sub E2~~
2 ~~1.~~ A recombinant immunoconjugate, comprising a therapeutic
3 agent or a detectable label peptide bonded to a recombinant anti-CD22
4 antibody having a V_H with a cysteine at amino acid position 44 and a V_L with a
cysteine at amino acid position 100.

1 2. The recombinant immunoconjugate of claim 1, wherein said
2 therapeutic agent is a toxin.

1 3. The recombinant immunoconjugate of claim 2, wherein said
2 toxin is a *Pseudomonas* exotoxin (PE) or a cytotoxic fragment thereof.

1 4. The recombinant immunoconjugate of claim 3, wherein said
2 cytotoxic fragment is PE38.

1 ~~Sub C2~~ 5. The recombinant immunoconjugate of claim 1, wherein said
2 anti-CD22 antibody is an RFB4 binding fragment.

1 6. The recombinant immunoconjugate of claim 1, wherein said
2 antibody comprises a variable heavy (V_H) chain substantially similar to SEQ ID
3 NO:2 and a variable light (V_L) chain substantially similar to SEQ ID NO:4.

1 7. The recombinant immunoconjugate of claim 3, wherein said
2 variable heavy (V_H) chain is peptide bonded to the ^{amino}terminus of said
3 toxin.

1 8. The recombinant immunoconjugate of claim 6, wherein said
2 V_H chain is peptide bonded to said V_L chain through a linker peptide.

1 ~~Sub D42~~ 9. The recombinant immunoconjugate of claim 6, wherein said
2 V_H chain is linked to said V_L chain through a cysteine-cysteine disulfide bond.

1 10. The recombinant immunoconjugate of claim 8, wherein said
2 linker peptide has the sequence of SEQ ID NO:5.

1 ~~E4 Sub 11.~~ An expression cassette encoding a recombinant
2 immunoconjugate, comprising a sequence encoding for a toxin peptide and an
3 anti-CD22 antibody having a V_H encoding for a cysteine at amino acid position
44 and a V_L encoding for a cysteine at amino acid position 100.

1 12. The expression cassette of claim 11, wherein said antibody
2 is an RFB4 dsFv.

1 13. The expression cassette of claim 11, wherein said toxin is a
2 *Pseudomonas* exotoxin (PE) or a cytotoxic fragment thereof.

1 14. The expression cassette of claim 11, wherein said cytotoxic
2 fragment is PE38.

1 ~~Sub C4~~ 15. The expression cassette of claim 11, wherein said antibody
2 comprises a variable heavy (V_H) chain substantially similar to SEQ ID NO:1 and
3 a variable light (V_L) chain substantially similar to SEQ ID NO:3.

1 ~~Sub D4~~ 16. The expression cassette of claim 15, further comprising a
2 sequence encoding for a linker peptide having the sequence of SEQ ID NO:5.


1 ~~Sub F1~~ 17. A host cell comprising an expression cassette of claim 11.

1 18. A V_H sequence substantially similar to that of SEQ ID NO:2.

1 19. A V_L sequence substantially similar to that of SEQ ID NO:4.

1 20. A nucleic acid sequence substantially similar to that of SEQ
2 ID NO:1.

1 ~~21.~~ A nucleic acid sequence substantially similar to that of SEQ
2 ID NO:3.

1  22. A method for inhibiting the growth of a malignant B-cell,
2 said method comprising:
3 contacting said malignant B-cell with an effective
4 amount of a recombinant immunoconjugate of claim 1.

1 23. The method of claim 22, wherein said toxin is a
2 *Pseudomonas* exotoxin (PE) or a cytotoxic fragment thereof.

1 24. The method of claim 22, wherein said malignant B-cell is
2 contacted *in vivo*.

25. The method of claim 22, wherein said malignant B-cell is selected from the group consisting of: a rodent B-cell, a canine B-cell, and a primate B-cell.

1 26. The method of claim 23, wherein said cytotoxic fragment is
2 a PE38 fragment.

1 ²⁶ 27. The method of claim 22, wherein said immunoconjugate is
2 an RFB4 binding fragment.

1 28. The method of claim 22, wherein said immunoconjugate
2 comprises a variable heavy (V_H) chain of SEQ ID NO:2 and a variable light (V_L)
3 chain of SEQ ID NO:4.

1 29. The method of claim 23, wherein a variable heavy chain is
2 peptide bonded at the carboxyl terminus of said toxin.

7 (b) allowing said antibody to bind to said CD22 protein
8 under immunologically reactive conditions, wherein
9 detection of said bound antibody indicates the presence of
10 said CD22 protein.

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1 38. The method of claim 37, wherein said antibody is detectably
2 labeled.

1 39. The method of claim 37, wherein the method is performed
2 *in vivo* in a mammal.

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